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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/824,898	04/02/2001	Eric B. Kushnick	CRED 2164	2197

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EXAMINER	
CHEN, TSE W	
ART UNIT	**PAPER NUMBER**
2116	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/824,898	KUSHNICK, ERIC B.	
	Examiner	Art Unit	
	Tse Chen	2116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 17-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 17-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment dated July 11, 2005.

2. Claims 1-38 are presented for examination. Applicant has canceled claims 15-16.

Claim Objections

3. Claims 10 are objected to because of the following informalities: "the first control signal" should be "a first control signal".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 4-8, 11, 20-21, 23-27, 30, 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Christiansen et al., "TTCrx Reference Manual", hereinafter Christiansen.

6. In re claim 1, Christiansen discloses an apparatus [fig.10] for generating pulses of a third pulse sequence [out] in response to pulses of a periodic first pulse sequence [in] having a period Tp [T], wherein timing of each pulse of the third pulse sequence is adjustable with a resolution [delta t] that is smaller than period Tp [Appendix A; TTCrx Architecture], the apparatus comprising:

- First means [first DLL] for generating each pulse of a second pulse [output from mux of first DLL] sequence in response to a separate pulse of the first pulse sequence with a first

delay adjustable by first control data [sel] with a resolution of Tp/N [delta tn] over a first range [T] substantially wider than Tp/M [delta tn-1], wherein M [N-1] and N are differing integers greater than one [fig.10].

- Second means [second DLL] for generating each pulse of the third pulse sequence in response to a separate pulse of the second pulse sequence with a delay adjustable by a second control data [sel] with a resolution of Tp/M [delta tn-1] over a second range [T] substantially wider than Tp/N [delta tn].
- A programmable sequencer [programmable fine deskew unit] for changing a magnitude of the first control data and a magnitude of the second control data in response to each pulse of the first pulse sequence such that the magnitude of the first and second control data vary repetitively in a programmably adjustable manner [programmable fine deskew unit programs appropriate output tap selection in each DLL in order to shift to desired time resolution of (delta tn-1) – (delta tn)].

7. As to claims 2 and 5, Christiansen discloses, wherein M [e.g., 4] and N [e.g., 5] are relatively prime [Appendix A].

8. As to claim 4, Christiansen discloses, wherein the first range is at least as wide as (1-1/N)Tp and the second range is at least as wide as (1-1/M)Tp [Appendix A; both DLLs cover T].

9. As to claim 6, Christiansen discloses, wherein the third pulse sequence is periodic [TTCrx Architecture; output periodic clock synchronous to the system clock is produced].

10. As to claim 7, Christiansen discloses, wherein the first means comprises a plurality of first gates connected in series for generating pulses of the second pulse sequence in response to

pulses of the first pulse sequence, wherein each first gate has a switching delay of Tp/N [T/N] [Appendix A].

11. As to claim 8, Christiansen discloses, wherein the second means comprises a plurality of second gates connected in series for generating pulses of the third pulse sequence in response to pulses of the second pulse sequence, wherein each second gate has a switching delay of Tp/M [T/N-1] [Appendix A].

12. As to claim 11, Christiansen discloses, wherein the first means comprises a plurality of first gates connected in series for generating pulses of the second pulse sequence in response to pulses of the first pulse sequence, wherein the second means comprises a plurality of second gates connected in series for generating pulses of the third pulse sequence in response to pulses of the second pulse sequence, wherein each first gate has a switching delay of Tp /N [T/N], and wherein each second gate has a switching delay of Tp/M [T/N-1] [Appendix A].

13. In re claim 20, Christiansen discloses each and every limitation of the claim as discussed above in reference to claim 1. Christiansen discloses the apparatus; therefore, Christiansen discloses the method of operating the apparatus.

14. As to claims 21 and 24, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 2 and 20.

15. As to claim 23, Christiansen discloses, wherein the first and second ranges are each at least as wide as Tp [Appendix A; both DLLs cover T].

16. As to claim 25, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 6 and 20.

17. As to claim 26, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 7 and 20.

18. As to claim 27, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 8 and 20.

19. As to claim 30, Christiansen discloses each and every limitation of the claim as discussed above in reference to claims 11 and 20.

20. In re claim 34, Christiansen discloses a method for generating pulses of a third pulse [out] sequence in response to pulses of a periodic first pulse sequence [in] having a period Tp [T], wherein timing of each pulse of the third pulse sequence is adjustable with a resolution [delta t] that is smaller than Tp [Appendix A; TTCrx Architecture], the method comprising the steps of:

a. Generating each pulse of a second pulse sequence [output from mux of first DLL] in response to a separate pulse of the first pulse sequence with a delay adjustable by a first control data [sel] with a resolution of Tp/N [T/N],

b. Generating each pulse of the third pulse sequence in response to a separate pulse of the second pulse sequence with a delay adjustable by a second control data [sel] with a resolution of Tp/M [T/N-1],

c. Generating the first control data and the second control data in response to each pulse of the first pulse sequence, and wherein M [N-1] and N are relatively prime integers greater than one [fig.10].

21. As to claim 35, Christiansen discloses, wherein step a comprises applying the first pulse sequence as input to a plurality of first gates connected in series so that the first gates generate pulses of the second pulse sequence, wherein step b comprises applying the second pulse

sequence as input to a plurality of second gates connected in series so that the second gates generate pulses of the third pulse sequence, wherein each first gate has a switching delay of Tp/N [T/N], and wherein each second gate has a switching delay of Tp/M [T/N-1] [Appendix A].

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23. Claims 3 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christiansen.

24. Christiansen discloses each and every limitation as discussed above in reference to claim 1. Christiansen did not disclose that at least one of the first and second ranges is wider than Tp.

25. Examiner hereby takes Official Notice that it is well known in the art to have at least one of the first and second ranges be wider than Tp in order to compensate for delay variations due to imperfections [e.g., manufacturing] and environment [e.g., temperature].

26. Claims 9-10, 12-14, 17-19, 28-29, 31-33, 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christiansen as applied to claims 8, 11, 17, 27, 30, 35 above, and further in view of Kim, US Patent 6388485.

27. Christiansen discloses each and every limitation as discussed above in reference to claim 8 and 11. Christiansen did not discuss the details of the phase detector and loop filter [fig.10].

28. Kim discloses an apparatus [30] for generating pulses of a third pulse sequence [iclk] in response to pulses of a periodic first pulse sequence [eclk] having a period Tp [fig.3].

29. In re claims 9 and 12, Kim discloses, wherein a second means [30] further comprises M third gates [master 326] connected in series for generating a fourth pulse sequence [fb] in delayed response to the first pulse sequence, wherein each of a second [slave 344] and third gate has a similar switching delay of Tp/M [td] set by the magnitude of a second control signal applied to all of the second and third gates [master/slave set to same in order to derive same td delay as is well known in the art] [col.3, ll.33-40, ll.46-63].

30. In re claims 10 and 13, Kim discloses, wherein the second means further comprises means [322, 324] for monitoring a phase relationship between the first pulse sequence and the fourth pulse sequence and adjusting the magnitude of a first control signal [dcon1] so that the fourth pulse sequence is phase-locked to the first pulse sequence [col.3, ll.33-40, ll.51-60].

31. It would have been obvious to one of ordinary skill in the art, having the teachings of Christiansen and Kim before him at the time the invention was made, to modify the apparatus taught by Christiansen to include the teachings of Kim, in order to obtain the claimed apparatus. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to minimize phase noise of an internal clock signal [Kim: col.2, ll.18-21].

32. As to claim 14, Christiansen discloses, wherein said plurality of first gates includes N first gates connected in series and delaying the first pulse sequence to produce a fifth pulse sequence [from delay gates to phase detector and loop filter], wherein the switching delay of each of said first gates is controlled by a magnitude of a first control signal supplied as input thereto [control signals going into each respective delay gates as is well known in the art], and wherein the first means further comprises means [phase detector and loop filter] for monitoring the first pulse sequence and the fifth pulse sequence and for adjusting the magnitude of the first

control signal so that the fifth pulse sequence is phase-locked to the first pulse sequence [Appendix A].

33. In re claim 17, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 1, 9 and 11.

34. In re claim 18, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 10 and 17.

35. In re claim 19, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 14 and 18.

36. In re claims 28 and 31, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 9 and 27.

37. In re claims 29 and 32, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 10 and 28.

38. In re claim 33, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 14 and 32.

39. In re claim 36, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 9 and 35.

40. In re claim 37, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 10 and 36.

41. In re claim 38, Christiansen and Kim disclose each and every limitation of the claim as discussed above in reference to claims 14 and 37.

Response to Arguments

42. Applicant's arguments filed July 11, 2005 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tse Chen whose telephone number is (571) 272-3672. The examiner can normally be reached on Monday - Friday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tse Chen
August 5, 2005

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